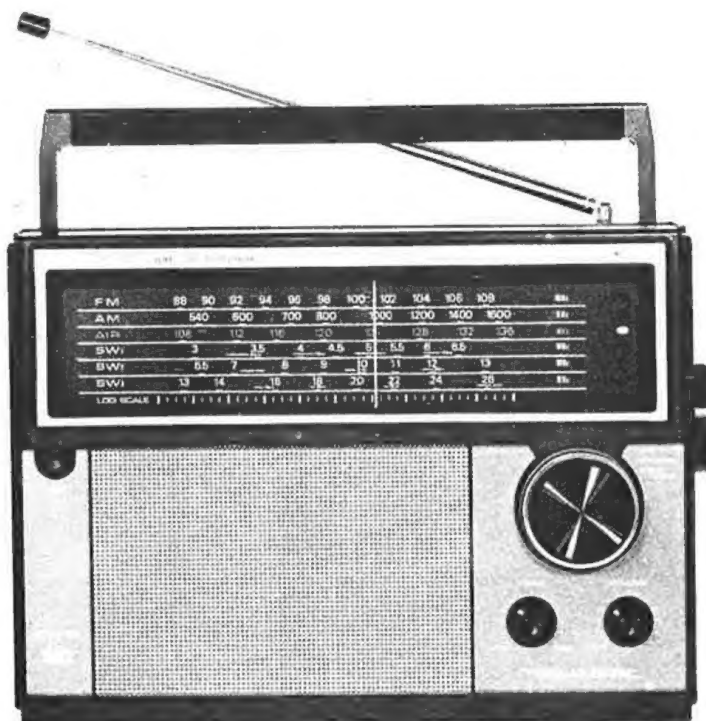


REALISTIC[®]

Service Manual

12-767

DX-66 AIR/SW MONITOR 6-BAND PORTABLE RADIO Catalog Number: 12-767



CUSTOM MANUFACTURED FOR RADIO SHACK  A DIVISION OF TANDY CORPORATION

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SPECIFICATIONS

The supply voltage is $6\text{ V} \pm 0.2\text{ V DC}$, from a regulated power supply.

The power source must be isolated from other equipment connected to antenna or output.

The room temperature is 25 degrees C (77 degrees F).

AM BAND

Speaker impedance: 4 ohms

Output readings are taken across a non-reactive load.

Output reference level is 50 mW total power.

The generator output shall terminate in an IRE loop and loop pointing toward rear of receiver.

Modulation: 400 Hz, 30 %

	UNIT	NOMINAL	LIMIT
Frequency Coverage	kHz	510—1650	520—1620
IF	kHz	455	± 5
Antenna Sensitivity for S/N 6 dB at 600 kHz	$\mu\text{V/m}$	100	200
at 1000 kHz	$\mu\text{V/m}$	100	200
at 1400 kHz	$\mu\text{V/m}$	100	200
Antenna Sensitivity for S/N 20 dB at 600 kHz	$\mu\text{V/m}$	280	500
at 1000 kHz	$\mu\text{V/m}$	280	500
at 1400 kHz	$\mu\text{V/m}$	280	500
S/N at 1 mV, 1000 kHz	dB	31	26
ACA at reference level at 1000 kHz	dB	25	15
AGC figure of merit	dB	45	36
IF rejection at 600 kHz	dB	34	28
Image rejection at 1400 kHz	dB	42	30
Band-width at 6 dB down	kHz	6	4—8
Output, at 10% THD at 1000 kHz 5 mV/m, 1000 Hz, 30% Mod.	mW	400	300
Distortion at reference output at 1000 Hz, 30% Mod. at 5 mV/m	%	1.5	5
DC Current drain, no signal	mA	15	25
Whistle modulation of 2nd & 3rd harmonic at 1—100 mV/m	%	3	15
Dial Calibration at 600 kHz	kHz	—	± 25
at 1000 kHz	kHz	—	± 50
at 1600 kHz	kHz	—	± 75

The oscillator must operate at 600 kHz, with all supply voltages about 4 V DC, an over-voltage of 10% shall not be harmful.

FM BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mW

Signal generator impedance: 75 ohms

Disconnect telescopic antenna cable.

The signal voltage in this specification or test data is the voltage appearing across the tuner input terminals.

Modulation: 400 Hz, 22.5 kHz deviation

	UNIT	NOMINAL	LIMIT
Frequency Coverage	MHz	86.5—109.5	88—108
IF	MHz	10.7	—
Sensitivity for 50 mW output, 6 dB S/N at 90 MHz	μV	5	10
at 98 MHz	μV	5	10
at 106 MHz	μV	5	10

	UNIT	NOMINAL	LIMIT
Sensitivity for 30 dB S/N at 90 MHz	μV	7	13
at 98 MHz	μV	7	13
at 106 MHz	μV	7	13
S/N at 1 mV, 98 MHz	dB	46	40
FM Limiting, 3 dB, 98 MHz, 22.5 kHz dev.	μV	15	50
IF rejection at 90 MHz, 22.5 kHz dev.	dB	70	50
Image rejection at 106 MHz	dB	30	20
ACA 100 μV \pm 400 kHz, 22.5 kHz dev.	dB	25	15
Audio THD, 400 Hz, 75 kHz dev. (1000 μV)	%	1.5	5
Lowest Battery Voltage for operation	V	—	4
Dial Calibration at 88 MHz	kHz	—	± 700
at 100 MHz	kHz	—	± 700
at 108 MHz	kHz	—	± 700
AFC holding, 1 mV input	kHz	300	± 150 — ± 350
Overload breakup	μV	200 K	100 K
De-Emphasis 22.5 kHz dev., 400 Hz at 0 dB	dB	—13.5	—13.5 \pm 3
Output Power at 10% THD, 1000 Hz	mV	400	300
Capture ratio at 1 mV dev., 400 Hz	dB	5	10

Set must meet the requirements of the FCC.

VHF Air BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mV

Signal generator impedance: 75 ohms

Disconnect telescopic antenna cable.

The signal voltage in this specification is the voltage appearing across the tuner input terminals.

Modulation: 400 Hz, 30%

	UNIT	NOMINAL	LIMIT
Frequency Coverage	MHz	106.5—137.5	108—136
IF	MHz	10.7	—
Sensitivity for 50 mW output, S/N 6 dB at 110 MHz	μV	5	15
at 120 MHz	μV	5	15
at 135 MHz	μV	5	15
Sensitivity for 20 dB S/N at 110 MHz	μV	10	30
at 120 MHz	μV	10	30
at 135 MHz	μV	10	30
IF rejection at 120 MHz	dB	60	50
Image rejection at 135 MHz	dB	24	16
Lowest Battery Voltage for operation	V	—	4
Dial Calibration at 108 MHz	kHz	—	± 800
at 136 MHz	kHz	—	± 800

All sets must meet the requirements of the FCC.

SW1 BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mW

The generator output shall terminate in an IRE loop with loop pointing toward rear of Receiver.

Modulation: 400 Hz, 30%

	UNIT	NOMINAL	LIMIT
Frequency Coverage	MHz	2.8–7.2	3–6.5
IF	kHz	455	±5
Sensitivity for reference output power, S/N 6 dB at 3.5 MHz	μV/m	100	150
at 5 MHz	μV/m	100	150
at 6.5 MHz	μV/m	100	150
Sensitivity for 20 dB S/N at 3.5 MHz	μV/m	200	400
at 5 MHz	μV/m	200	400
at 6.5 MHz	μV/m	200	400
S/N ratio at 1 mV/m	dB	34	26
ACA at reference level, 5 MHz	dB	25	15
AGC figure of merit at 5 MHz	dB	45	36
Image rejection at 6.5 MHz	dB	15	10
Output at 10% THD at 5 MHz, 5 mV/m	mW	400	300
Dial Calibration at 3 MHz	kHz	—	±300
6.5 MHz	kHz	—	±300

The oscillator must operate at 3.5 MHz, with all supply voltages about 4 V DC, an over-voltage of 10% shall not be harmful.

SW2 BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mW

Connect signal generator hot lead through 18 pF capacitor to antenna terminal.

Disconnect telescopic antenna cable.

	UNIT	NOMINAL	LIMIT
Frequency Coverage	MHz	6.0–13.7	6.5–13
IF	kHz	455	±5
Sensitivity for reference output power, S/N 6 dB at 7 MHz	μV	10	20
at 10 MHz	μV	10	20
at 13 MHz	μV	10	20
Sensitivity for 20 dB S/N at 7 MHz	μV	20	40
at 10 MHz	μV	20	40
at 13 MHz	μV	20	40
S/N at 100 μV, at 10 MHz	dB	34	28
ACA at reference level, 10 MHz	dB	25	15
AGC figure of merit at 10 MHz, 5 mV input	dB	45	36
Image rejection at 13 MHz	dB	10	4.5
Output at 10% THD, 10 MHz	mW	400	300
Dial Calibration at 6.5 MHz	kHz	—	±500
at 13 MHz	kHz	—	±500

The oscillator must operate at 7 MHz, with all supply voltages about 4 V DC, an over-voltage of 10% shall not be harmful.

SW3 BAND

Speaker impedance: 4 ohms

Use resistive load.

Reference output level: 50 mW

Modulation: 400 Hz, 30%

Connect signal generator hot lead through 18 pF capacitor to antenna terminal.

Disconnect telescopic antenna cable.

	UNIT	NOMINAL	LIMIT
Frequency Coverage	MHz	12.5–26.7	13–26
IF	kHz	455	±5
Sensitivity for reference output power, S/N 6 dB at 14 MHz	μV	7	20
at 20 MHz	μV	7	20
at 25 MHz	μV	7	20
Sensitivity for 20 dB S/N at 14 MHz	μV	20	40
at 20 MHz	μV	20	40
at 25 MHz	μV	20	40
S/N at 100 μV, at 20 MHz	dB	34	28
ACA at reference level, 20 MHz	dB	25	15
AGC figure of merit at 20 MHz, 50 mV input	dB	45	36
Image rejection at 25 MHz	dB	5	2
Output at 10% THD at 20 MHz	mW	400	300
Dial Calibration at 13 MHz	kHz	—	±500
at 26 MHz	kHz	—	±500

The oscillator must operate at 14 MHz, with all supply voltages about 4 V DC; an over-voltage of 10% shall not be harmful.

NOTE: Nominal Specs represent the design specs; all units should be able to approximate these — some will exceed and some may drop slightly below these specs. Limit Specs represent the absolute worst condition which still might be considered acceptable; in no case should a unit perform to less than within any Limit Spec.

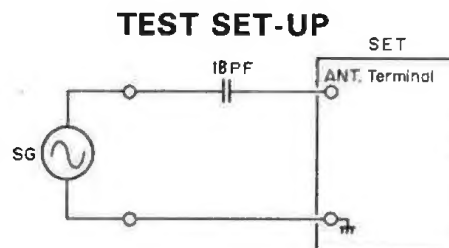
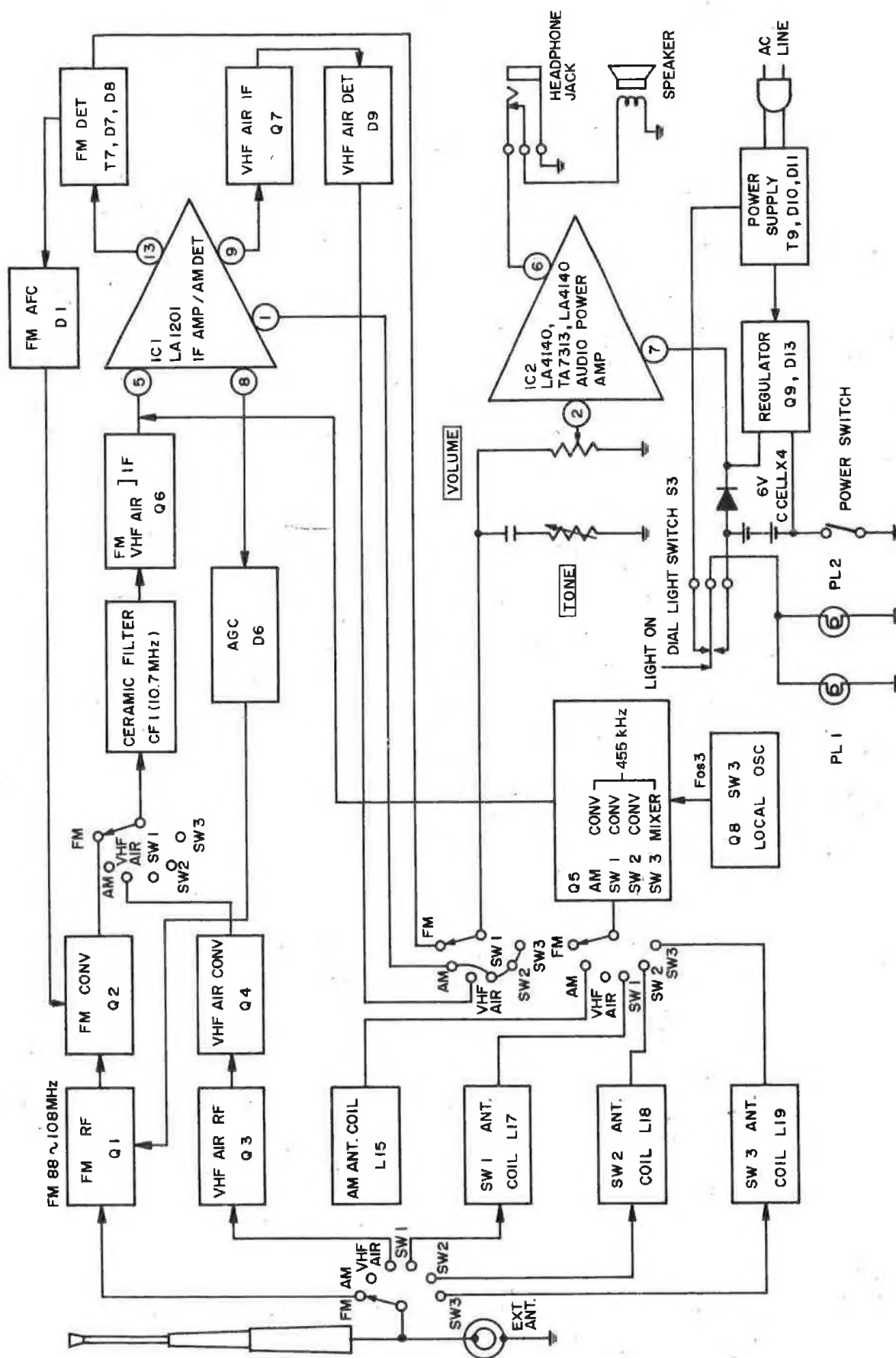
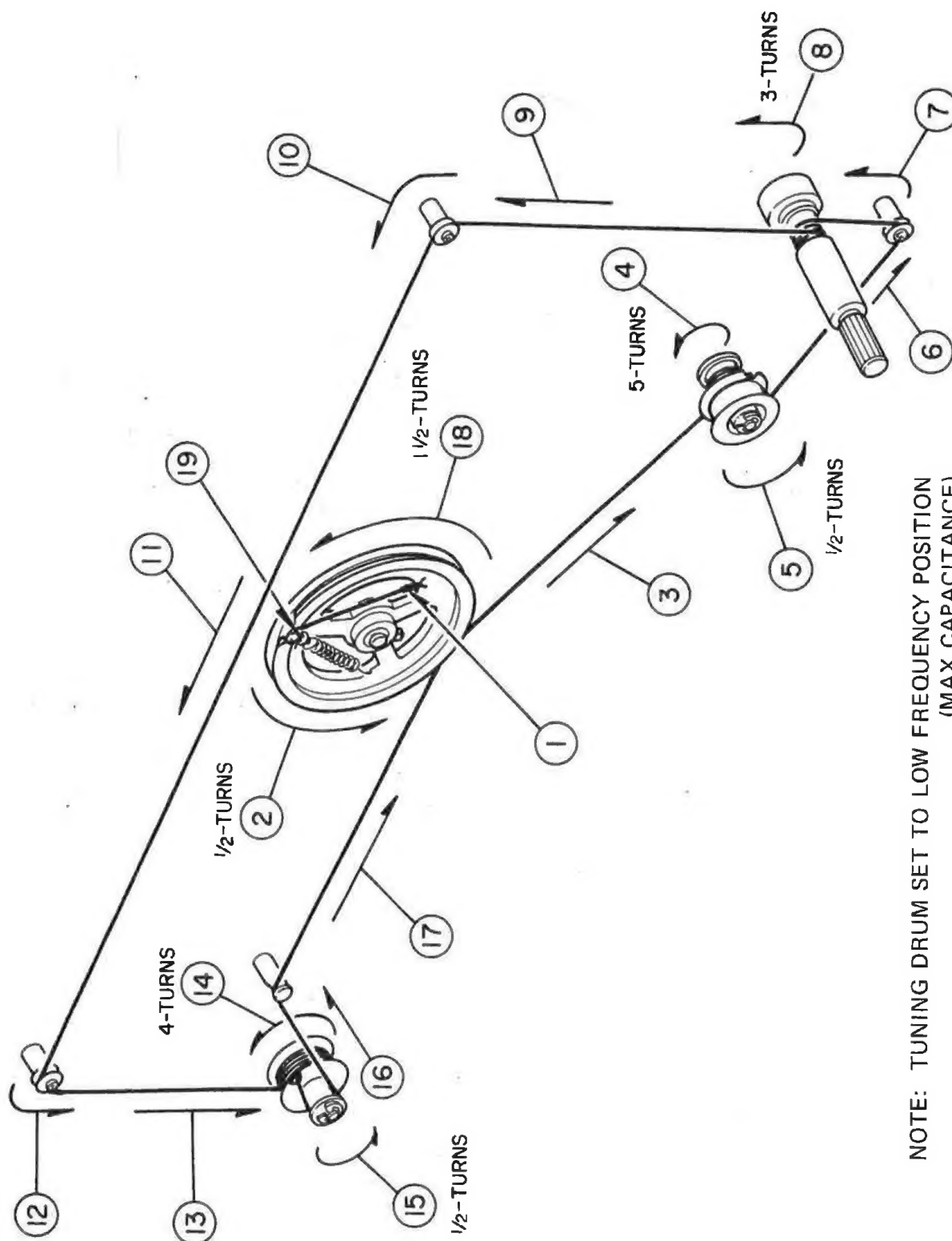


Figure 1

BLOCK DIAGRAM



DIAL STRINGING DIAGRAM



NOTE: TUNING DRUM SET TO LOW FREQUENCY POSITION
(MAX CAPACITANCE)

Figure 3

ALIGNMENT INSTRUCTIONS

ALIGNMENT POINTS LOCATION

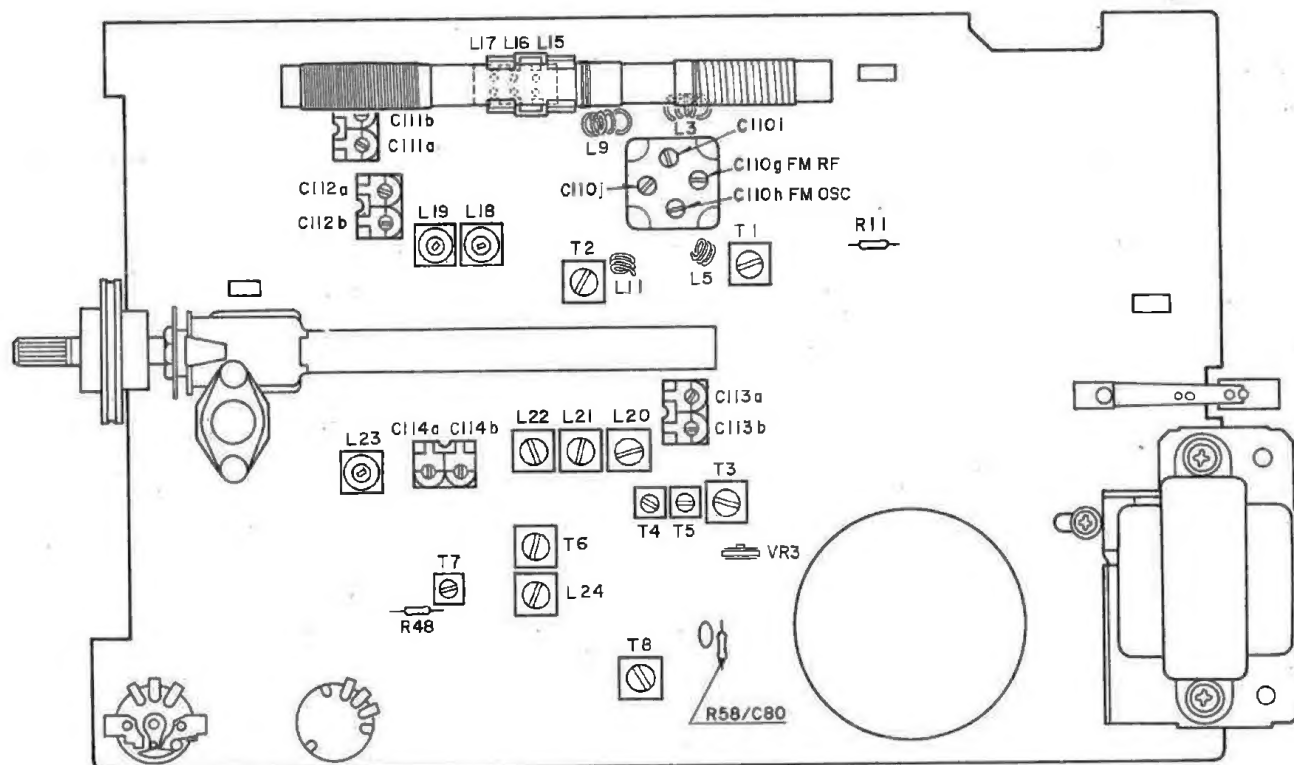


Figure 4

EQUIPMENT REQUIRED

1. AM Signal Generator
2. FM Signal Generator
3. Vacuum Tube Voltmeter
4. IF Sweep Generator
5. Oscilloscope
6. DC Voltmeter

GENERAL PREPARATION

1. Check source voltage.
2. Set function switch to band being aligned.
3. FM/AM/AIR/SW2 and SW3 telescopic antenna should be disconnected.
4. Standard input should be kept as low as possible to avoid AGC action.
5. Standard modulation is 400 Hz 30% for AM, AIR, SW1, SW2, SW3.
6. Standard modulation is 400 Hz 22.5 kHz deviation for FM.
7. Connection of signal generator to be between chassis ground and EXT. ANT. JACK.

IC 1 BIAS ADJUSTMENT

Alignment	Equipment	Connection	Step	Gen. Freq.	Dial Setting	Adjustment	For
IC1 BIAS	DC Volt Meter (above 50 K Ω /V)	See Figure 5.			No signal AM Band Maximum Frequency	VR3	Adjust for 0.5 V between terminals 4 and 6.

AM, SW1, SW3, IF ALIGNMENT

Alignment	Equipment	Connection	Step	Gen. Freq.	Dial Setting	Adjustment	For
IF	AM Signal Generator, V.T.V.M.	See Figure 6.		455 kHz	Maximum Frequency	T4, T5, L24	Maximum Output

AM ALIGNMENT

Alignment	Equipment	Connection	Step	Gen. Freq.	Dial Setting	Adjustment	For
TUNING COVERAGE	AM Signal Generator, V.T.V.M.	See Figure 7.	1	510 kHz	Maximum Frequency	L20 OSC. Coil	Maximum Output
			2	1650 kHz	Maximum Frequency	C113a	Maximum Output
			3	Repeat steps 1 and 2 until tuning coverage is exactly from 510 kHz to 1650 kHz.			
TRACKING	AM Signal Generator, V.T.V.M.	See Figure 7.	1	600 kHz	Tune to Signal.	L15 Antenna Coil	Maximum Output
			2	1400 kHz	Tune to Signal.	C111a	Maximum Output
			3	Repeat steps 1 and 2 until no further improvement can be made.			

FM ALIGNMENT

Alignment	Equipment	Connection	Step	Gen. Freq.	Dial Setting	Adjustment	For
IF	IF Sweep Generator, Oscilloscope	See Figure 8.		10.7 MHz	Maximum Frequency	T1, T3, T6, T7	Symmetrical S-Curve on Scope
TUNING COVERAGE	FM Signal Generator, V.T.V.M.	See Figure 9.	1	88 MHz	88 MHz	L5 (Stretch or Squeeze.)	Maximum Output
			2	108 MHz	108 MHz	C110h	Maximum Output
			3	Repeat steps 1 and 2 until tuning coverage is exactly from 88 MHz to 108 MHz.			
TRACKING	FM Signal Generator, V.T.V.M.	See Figure 9.	1	90 MHz	Tune to Signal.	L3 (Stretch or Squeeze.)	Maximum Output
			2	106 MHz	Tune to Signal.	C110g	Maximum Output
			3	Repeat steps 1 and 2 until no further improvement can be made.			

VHF Air ALIGNMENT

Alignment	Equipment	Connection	Step	Gen. Freq.	Dial Setting	Adjustment	For
IF	IF Sweep Generator, Oscilloscope	See Figure 10.		10.7 MHz	Maximum Frequency	T2, T8	Symmetrical S-Curve on Scope
TUNING RANGE	AM Signal Generator V.T.V.M.	See Figure 11.	1	106.5 MHz	106.5 MHz	L11 (Stretch or Squeeze.)	Maximum Output
			2	137.5 MHz	137.5 MHz	C110j	Maximum Output
			3	Repeat steps 1 and 2 until tuning range covers exactly from 144 MHz to 174 MHz.			
TRACKING	AM Signal Generator, V.T.V.M.	See Figure 11.	1	110 MHz	Tune to Signal.	L9 (Stretch or Squeeze.)	Maximum Output
			2	135 MHz	Tune to Signal.	C110i	Maximum Output
			3	Repeat steps 1 and 2 until no further improvement can be made.			

SW1 ALIGNMENT

Alignment	Equipment	Connection	Step	Gen. Freq.	Dial Setting	Adjustment	For
TUNING RANGE	AM Signal Generator, V.T.V.M.	See Figure 12.	1	2.8 MHz	2.8 MHz	L21 OSC. Coil	Maximum Output
			2	7.2 MHz	7.2 MHz	C113b	Maximum Output
			3	Repeat steps 1 and 2 until tuning range covers exactly from 3 MHz to 7 MHz.			
TRACKING	AM Signal Generator, V.T.V.M.	See Figure 12.	1	3.5 MHz	Tune to Signal.	L17 Antenna Coil	Maximum Output
			2	6.5 MHz	Tune to Signal.	C111b	Maximum Output
			3	Repeat steps 1 and 2 until no further improvement can be made.			

SW2 ALIGNMENT

Alignment	Equipment	Connection	Step	Gen. Freq.	Dial Setting	Adjustment	For
TUNING RANGE	AM Signal Generator, V.T.V.M.	See Figure 13.	1	6.0 MHz	6.0 MHz	L22 OSC. Coil	Maximum Output
			2	13.7 MHz	13.7 MHz	C114a	Maximum Output
			3	Repeat steps 1 and 2 until tuning range covers exactly from 7 MHz to 18 MHz.			
TRACKING	AM Signal Generator, V.T.V.M.	See Figure 13.	1	7 MHz	Tune to Signal.	L18 Antenna Coil	Maximum Output
			2	13 MHz	Tune to Signal.	C112a	Maximum Output
			3	Repeat steps 1 and 2 until no further improvement can be made.			

SW3 ALIGNMENT

Alignment	Equipment	Connection	Step	Gen. Freq.	Dial Setting	Adjustment	For
TUNING RANGE	AM Signal Generator, V.T.V.M.	See Figure 14.	1	12.5 MHz	12.5 MHz	L23 OSC. Coil	Maximum Output
			2	26.7 MHz	26.7 MHz	C114b	Maximum Output
			3	Repeat steps 1 and 2 until tuning range covers exactly from 18 MHz to 26 MHz.			
TRACKING	AM Signal Generator, V.T.V.M.	See Figure 14.	1	14 MHz	Tune to Signal.	L19 Antenna Coil	Maximum Output
			2	25 MHz	Tune to Signal.	C112b	Maximum Output
			3	Repeat steps 1 and 2 until no further improvement can be made.			

EQUIPMENT CONNECTIONS

INTEGRATED CIRCUIT BIAS



Figure 5

AM, SW1, SW2, SW3 IF

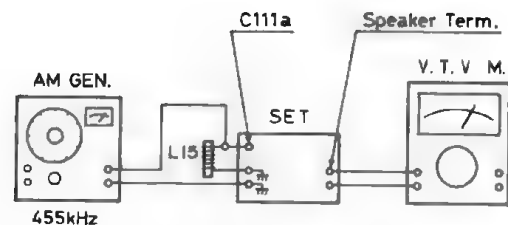


Figure 6

AM BAND/TRACKING

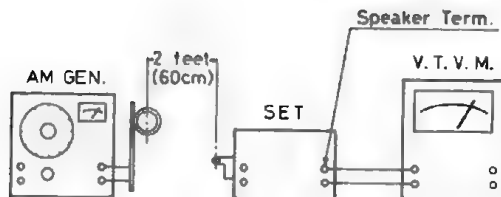


Figure 7

FM IF

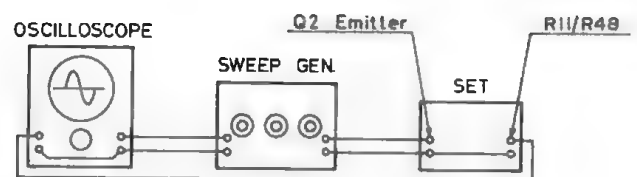


Figure 8

FM BAND/TRACKING

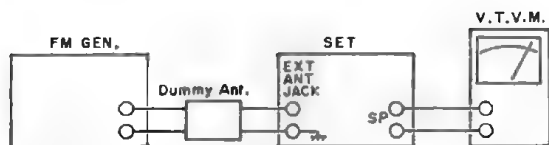


Figure 9

VHF AIR IF

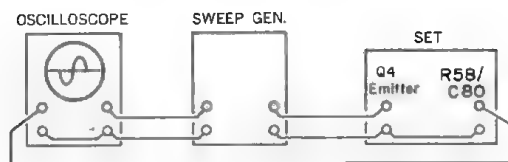


Figure 10

VHF AIR BAND/TRACKING

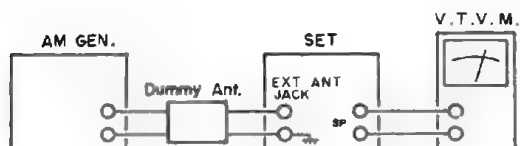


Figure 11

SW1 BAND/TRACKING

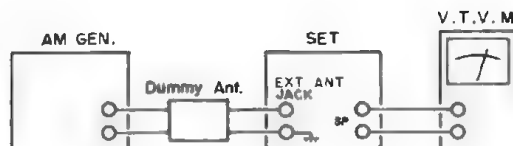


Figure 12

SW2 BAND/TRACKING

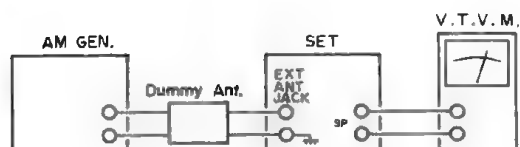


Figure 13

SW3 BAND/TRACKING

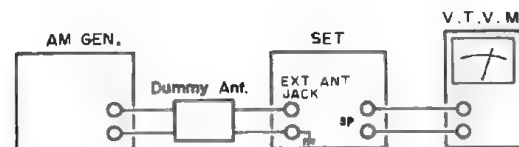


Figure 14

SCHEMATIC OF DUMMY ANTENNA

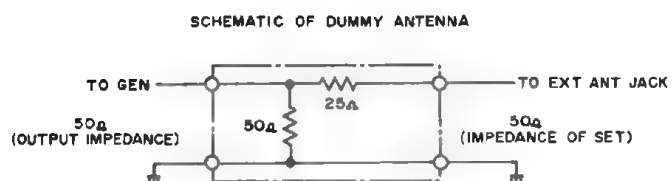


Figure 15

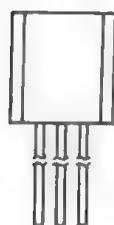
TROUBLESHOOTING CHART

SYMPTOM	CAUSE AND REMEDY
1) No output	<p>A) Faulty AC power cord: Replace.</p> <p>B) Broken wire in the Battery Case: Repair or replace.</p> <p>C) Battery polarity is wrong: Correct batteries.</p> <p>D) Weak batteries: Replace.</p> <p>E) Rectifier defective: Replace.</p> <p>F) Defective Q9 or D13 circuitry: Replace defective component.</p> <p>G) HEADPHONE JACK is defective: Repair or replace.</p> <p>H) Speaker voice coil is broken: Replace.</p> <p>I) Open power transformer: Replace.</p> <p>J) Defect in the power switch: Replace.</p> <p>K) Defective IC: Replace defective IC.</p> <p>L) Defect in the power switch: Repair or replace.</p> <p>M) Defect in VOLUME (VR2): Replace.</p>
2) No AM	<p>A) Poor contact in selector switch: Repair or replace.</p> <p>B) Transistor, diode, IFT, IC, resistor, coil or capacitor in AM IF circuit defective: Replace the defective component(s).</p> <p>C) Bar Antenna coil defective: Repair or replace.</p>
3) No FM	<p>A) Poor contact in selector switch: Repair or replace.</p> <p>B) Transistor, diode, IFT, IC, coil, resistor or capacitor in FM IF circuit defective: Replace the defective component(s).</p> <p>C) Poor contact in ANT lead: Repair as required.</p>
4) No VHF AIR	<p>A) Poor contact in selector switch: Repair or replace.</p> <p>B) Transistor, diode, IFT, IC, coil, resistor or capacitor in VHF AIR IF circuit defective: Replace the defective component(s).</p> <p>C) Poor contact in ANT. lead: Repair as required.</p>

SYMPTOM	CAUSE AND REMEDY
5) No SW1	A) Poor contact in selector switch: Repair or replace. B) Transistor, diode, IFT, IC, resistor, coil or capacitor in SW IF circuit defective: Replace the defective component(s): C) Defective Antenna coil L12: Replace.
6) No SW2	A) Poor contact in selector switch: Repair or replace. B) Transistor, diode, IFT, IC, coil, resistor or capacitor in SW IF circuit defective: Replace the defective component(s). C) Antenna coil defective: Repair or replace.
7) No SW3	A) Poor contact in selector switch: Repair or replace. B) Transistor, diode, IFT, IC, coil, resistor or capacitor in SW IF circuit defective: Replace the defective component(s). C) Defective Antenna coil L19: Replace.
8) No effect at full length of rod Antenna on FM	A) Poor contact of band selector switch and Antenna: Repair or replace. B) Broken wire between band selector switch and rod antenna: Repair or replace.
9) No effect when connecting EXT. ANT.	A) Poor contact on jack for EXT. ANT. or defective jack: Repair or replace.
10) HEADPHONE jack does not function.	A) Poor contact on HEADPHONE jack or defective jack: Repair or replace.
11) TONE does not work.	A) Control VR1 defective: Replace. B) Defective C83: Replace.
12) Distortion	A) Power voltage is lower than required: Replace batteries.

IC & TRANSISTOR LEAD IDENTIFICATION

TRANSISTOR LEAD IDENTIFICATION



ECB

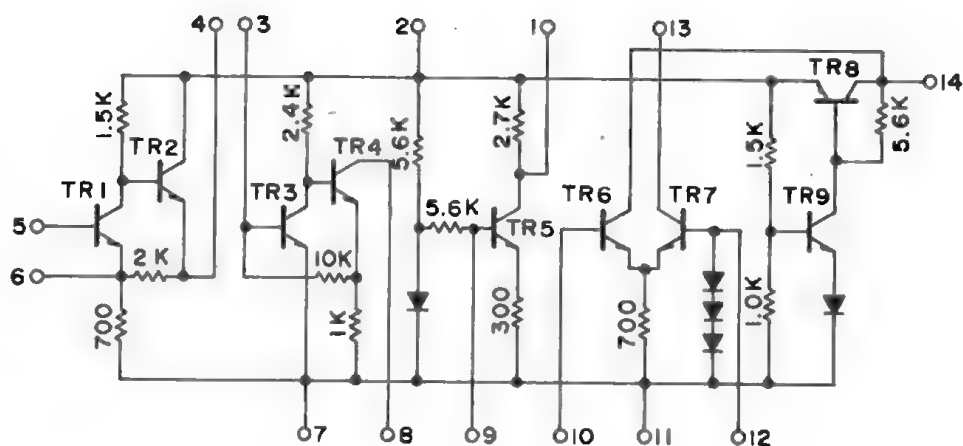
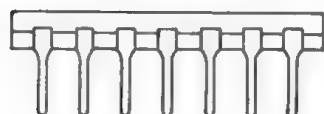
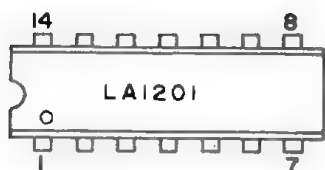


2SC930
2SC1674
2SC1959
2SC2120

IC INTERNAL CONNECTION

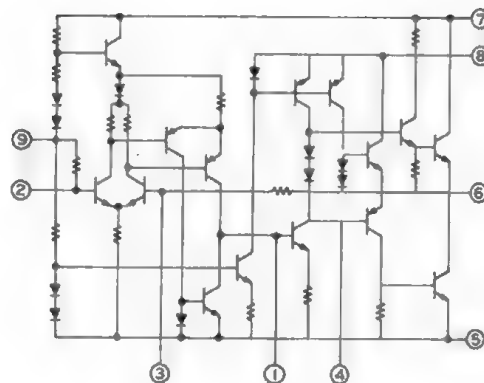
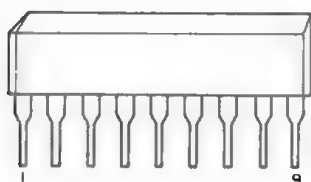
IC-1

LA1201



IC-2

LA4140
TA7313
KIA7313



IC & TRANSISTOR VOLTAGE CHART

IC VOLTAGE CHART

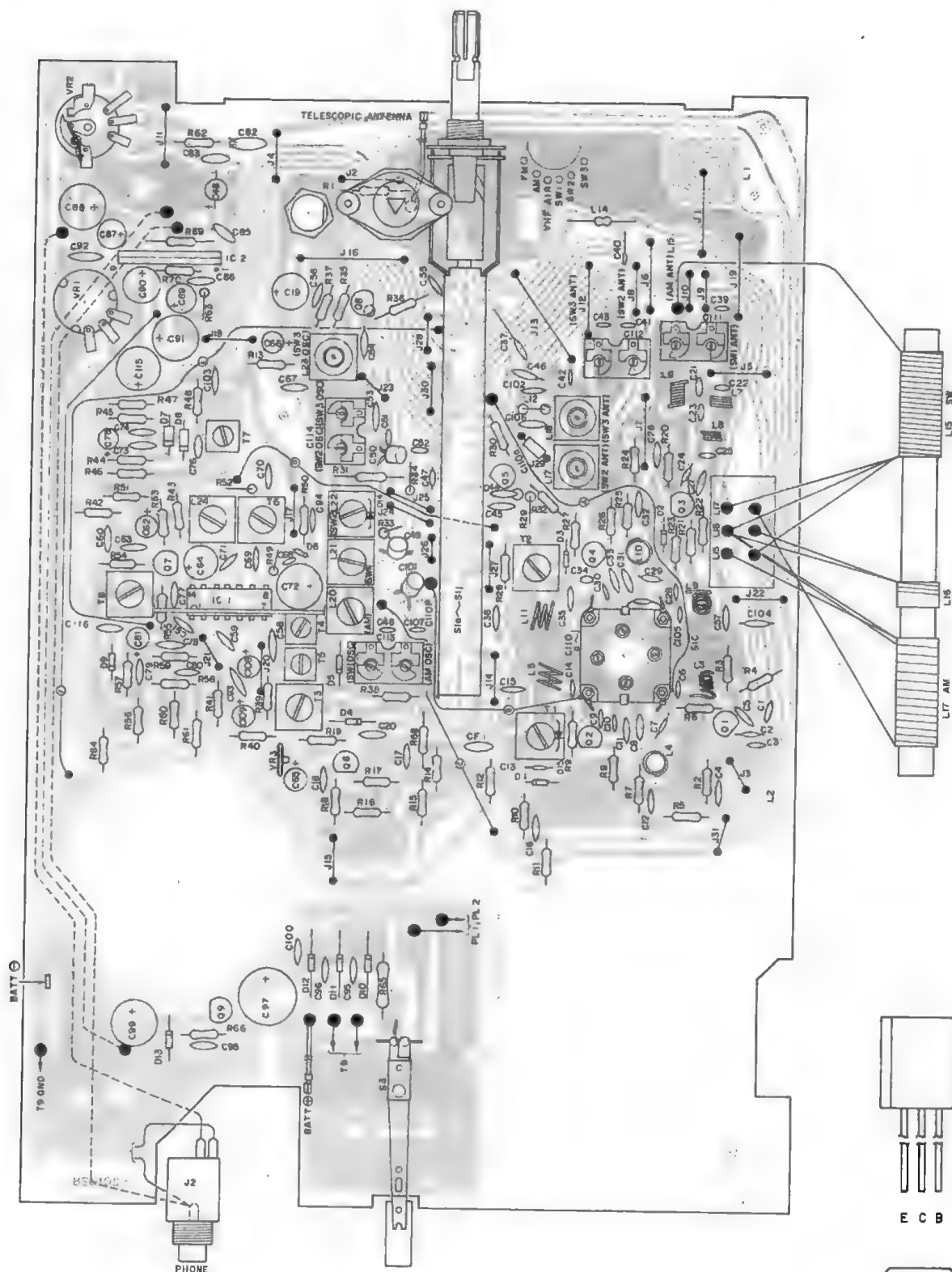
	Pin No.	1	2	3	4	5	6	7	8	9	10	11	12	13	14
IC-1	FM	2.4	2.9	0.7	0.9	1.3	0.6	0	2.7	0.7	2.0	0	2.0	5.0	5.5
	AM	2.4	2.9	0.7	0.9	1.3	0.6	0	2.7	0.7	2.0	0	2.0	5.0	5.5
	AIR	2.4	2.9	0.7	0.9	1.3	0.6	0	2.7	0.7	2.0	0	2.0	5.0	5.5
	SW1	2.4	2.9	0.7	0.9	1.3	0.6	0	2.7	0.7	2.0	0	2.0	5.0	5.5
	SW2	2.4	2.9	0.7	0.9	1.3	0.6	0	2.7	0.7	2.0	0	2.0	5.0	5.5
	SW3	2.4	2.9	0.7	0.9	1.3	0.6	0	2.7	0.7	2.0	0	2.0	5.0	5.5
	Pin No.	1	2	3	4	5	6	7	8	9					
IC-2	FM	0.7	2.9	2.9	2.8	0	2.8	6.0	5.7	3.0					
	AM	0.7	2.9	2.9	2.8	0	2.8	6.0	5.7	3.0					
	AIR	0.7	2.9	2.9	2.8	0	2.8	6.0	5.7	3.0					
	SW1	0.7	2.9	2.9	2.8	0	2.8	6.0	5.7	3.0					
	SW2	0.7	2.9	2.9	2.8	0	2.8	6.0	5.7	3.0					
	SW3	0.7	2.9	2.9	2.8	0	2.8	6.0	5.7	3.0					

NOTE: All voltage values are indicated in volts with no signal, measured with V.T.V.M.

TRANSISTOR VOLTAGE CHART

Transistor Number	Q1			Q2			Q3			Q4			Q5		
	E	C	B	E	C	B	E	C	B	E	C	B	E	C	B
FM	0.3	5.5	0.9	1.7	5.5	2.1	5.0	5.5	1.7	5.0	5.5	5.4	3.0	5.4	3.7
AM	5.0	5.6	1.0	5.0	5.6	5.4	5.0	5.6	1.3	5.0	5.6	5.4	3.1	5.4	3.6
AIR	5.0	5.5	1.0	5.0	5.5	5.3	0.5	5.4	1.2	2.4	5.4	3.0	3.0	5.4	3.7
SW1	5.0	5.6	1.0	5.0	5.6	5.3	5.0	5.6	1.3	5.0	5.6	5.4	3.1	5.4	3.7
SW2	5.0	5.6	1.0	5.0	5.6	5.3	5.0	5.6	1.3	5.0	5.6	5.5	3.0	5.4	3.7
SW3	5.0	5.6	1.0	5.0	5.6	5.3	5.0	5.6	1.3	5.0	5.6	5.4	3.0	5.4	3.7
Transistor Number	Q6			Q7			Q8			Q9					
	E	C	B	E	C	B	E	C	B	E	C	B			
FM	0.9	5.5	1.5	5.0	5.5	5.3	2.4	5.5	2.8	6.0	6.6	10.6			
AM	0.4	5.6	1.0	5.0	5.6	5.3	2.5	5.6	2.8	6.0	6.6	10.6			
AIR	0.3	5.5	0.9	0.8	5.0	1.5	2.4	5.5	2.8	6.0	6.6	10.6			
SW1	0.4	5.6	1.0	5.0	5.6	5.3	2.5	5.6	2.8	6.0	6.6	10.6			
SW2	0.4	5.6	1.0	5.1	5.6	5.3	2.5	5.6	2.8	6.0	6.6	10.6			
SW3	0.4	5.5	1.0	5.0	5.6	5.3	0.3	5.5	1.0	6.0	6.6	10.6			

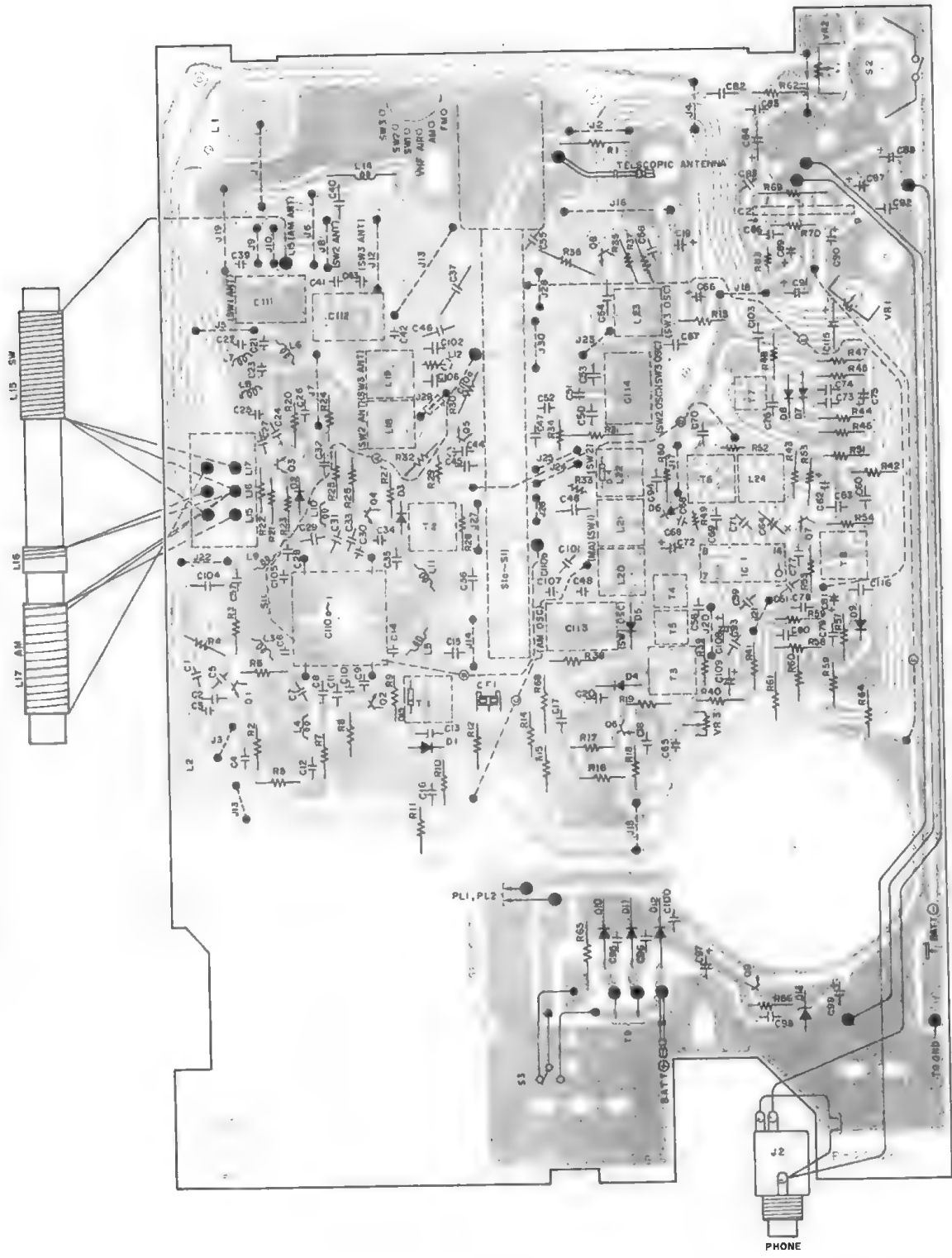
PRINTED CIRCUIT BOARD (TOP VIEW)



2SC930
2SC1674
2SC1959
2SC2120

PRINTED CIRCUIT BOARD (BOTTOM VIEW)

LAMP P.C.B.



ELECTRICAL PARTS LIST

Ref. No.	Description	RS Part No. (Mfr's Part No.)	Ref. No.	Description	RS Part No. (Mfr's Part No.)
CAPACITORS SL: 350–1000 ppm/°C NPO: 0 ± 60 ppm/°C					
C1	10 pF ± 0.5 pF 50 WV SL Ceramic		C52	0.0068 μF 50 WV Mylar	
C2	22 pF ± 10% 50 WV SL Ceramic		C53	51 pF ± 10% 50 WV NPO Ceramic	
C3	30 pF ± 10% 50 WV SL Ceramic		C54	330 pF ± 10% 50 WV SL Ceramic	
C4	0.022 μF 25 WV Ceramic		C55	0.022 μF 25 WV Ceramic	
C5	0.01 μF 50 WV Ceramic		C56	0.01 μF 50 WV Ceramic	
C6	20 pF ± 10% 50 WV SL Ceramic		C57	0.022 μF 25 WV Ceramic	
C7	4 pF ± 0.5 pF 50 WV SL Ceramic		C58	0.047 μF 25 WV Ceramic	
C8	470 pF ± 10% 50 WV SL Ceramic		C59	0.022 μF 25 WV Ceramic	
C9	5 pF ± 0.5 pF 50 WV NPO Ceramic		C60	0.01 μF 50 WV Ceramic	
C10	39 pF ± 10% 50 WV SL Ceramic		C61	0.01 μF 50 WV Ceramic	
C11	0.01 μF 50 WV Ceramic		C62	10 μF/10 V Electrolytic	
C12	0.022 μF 25 WV Ceramic		C63	0.04 μF 25 WV Ceramic	
C13	5 pF ± 0.5 pF 50 WV NPO Ceramic		C64	100 μF/6.3 V Electrolytic	
C14	16 pF ± 10% 50 WV NPO Ceramic		C65	10 μF/10 V Electrolytic	
C15	0.022 μF 25 WV Ceramic		C66	4.7 μF/16 V Electrolytic	
C16	0.022 μF 25 WV Ceramic		C67	0.022 μF 25 WV Ceramic	
C17	0.01 μF 50 WV Ceramic		C68	2 pF ± 0.5 pF 50 WV SL Ceramic	
C18	0.01 μF 50 WV Ceramic		C69	0.022 μF 25 WV Ceramic	
C19	100 μF/6.3 V Electrolytic		C70	0.022 μF 25 WV Ceramic	
C20	0.022 μF 25 WV Ceramic		C71	0.022 μF 25 WV Ceramic	
C21	33 pF ± 10% 50 WV SL Ceramic		C72	470 μF/6.3 V Electrolytic	
C22	33 pF ± 10% 50 WV SL Ceramic		C73	0.01 μF 50 WV Ceramic	
C23	13 pF ± 10% 50 WV SL Ceramic		C74	0.01 μF 50 WV Ceramic	
C24	13 pF ± 10% 50 WV SL Ceramic		C75	3.3 μF/16 V Electrolytic	
C25	15 pF ± 10% 50 WV SL Ceramic		C76	0.015 μF 50 WV Mylar	
C26	0.022 μF 25 WV Ceramic		C77	0.022 μF 25 WV Ceramic	
C27	0.01 μF 50 WV Ceramic		C78	0.022 μF 25 WV Ceramic	
C28	180 pF ± 10% 50 WV SL Ceramic		C79	0.01 μF 50 WV Ceramic	
C29	4 pF ± 0.5 pF 50 WV SL Ceramic		C80	0.027 μF 50 WV Mylar	
C30	56 pF ± 10% 50 WV SL Ceramic		C81	10 μF/10 V Electrolytic	
C31	470 pF ± 10% 50 WV SL Ceramic		C82	0.1 μF 50 WV Mylar	
C32	0.022 μF 25 WV Ceramic		C83	0.039 μF 50 WV Mylar	
C33	0.01 μF 50 WV Ceramic		C84	0.47 μF/16 V Electrolytic	
C34	4 pF ± 0.5 pF 50 WV NPO Ceramic		C85	0.022 μF 50 WV Mylar	
C35	180 pF ± 10% 50 WV NPO Ceramic		C86	0.001 μF 50 WV Mylar	
C36	0.022 μF 25 WV Ceramic		C87	47 μF/10 V Electrolytic	
C37	0.022 μF 25 WV Ceramic		C88	220 μF/10 V Electrolytic	
C38	Not used		C89	33 μF/10 V Electrolytic	
C39	15 pF ± 10% 50 WV SL Ceramic		C90	100 μF/6.3 V Electrolytic	
C40	10 pF ± 0.5 pF 50 WV SL Ceramic		C91	220 μF/10 V Electrolytic	
C41	27 pF ± 10% 50 WV SL Ceramic		C92	0.1 μF 25 WV Ceramic Barrier	
C42	47 pF ± 10% 50 WV SL Ceramic		C93	0.04 μF 25 WV Ceramic	
C43	68 pF ± 10% 50 WV SL Ceramic		C94	0.047 μF 25 WV Ceramic	
C44	0.022 μF 25 WV Ceramic		C95	0.022 μF 25 WV Ceramic	
C45	0.022 μF 25 WV Ceramic		C96	0.022 μF 25 WV Ceramic	
C46	0.022 μF 25 WV Ceramic		C97	470 μF/10 V Electrolytic	
C47	0.01 μF 50 WV Mylar			(For USA/Canada)	
C48	25 pF ± 10% 50 WV NPO Ceramic		C97	470 μF/16 V Electrolytic	
C49	1500 pF ± 5% 50 WV Polystyrene			(For Australia/UK)	
C50	3900 pF ± 5% 50 WV Polystyrene		C98	0.01 μF 50 WV Ceramic	
C51	39 pF ± 10% 50 WV NPO Ceramic		C99	470 μF/10 V Electrolytic	
			C100	0.022 μF 25 WV Ceramic	
			C101	270 pF ± 5% 50 WV Polystyrene	

Ref. No.	Description	RS Part No. (Mfr's Part No.)
C102	56 pF ± 10% 50 WV SL Ceramic	P-150023
C103	0.022 μF 50 WV Mylar	
C104	0.022 μF 25 WV Ceramic	
C105	5 pF ± 0.5 pF 50 WV SL Ceramic	
C106	15 pF ± 10% 50 WV SL Ceramic	
C107	5 pF ± 0.5 pF 50 WV NPO Ceramic	
C108	1 μF/16 V Electrolytic	
C109	0.47 μF/16 V Electrolytic	
C110a	266 pF x 2 20 pF x 4	
-j	Poly-Variable Capacitor	
C111-	2T-15P or 2T-16M or Trimmer	
C114a,b	AT2-52W Capacitor	
C115	470 μF/6.3 V Electrolytic	
C116	0.047 μF 25 WV Ceramic	

CERAMIC FILTER

CF1	SFE10.7MA or CF-42MM or CF-A01 or KBF-10.7MU-MA	P-140022 or P-140036 or P-140047 or P-140064
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DIODES

D1	1S2687 or ITT410.	Varicap
D2-	1S953 or 1S1555 or	Silicon
4	WG713	
D5-	1N60P or	Germanium
8	1K188FM	
D9	1S953 or 1S1555 or	Silicon
	WG713	
D10	10E-1 or	Silicon
-12	1N4002	
D13	WZ065 or RD6.8EB1	Zener
D14	1S953 or 1S1555 or	Silicon
	WG713	
D15	1N60P or 1K188FM	Germanium

INTEGRATED CIRCUITS

IC-1	LA1201	
IC-2	TA7313AP or KIA7313P or LA4140	

JACK

J1	Antenna Jack	P-190075
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COILS

L1	Not used	
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Ref. No.	Description	RS Part No. (Mfr's Part No.)
L2	Not used	
L3	Air Coil	HR4-4½ T1
L4	Air Coil	VL4-14½ T1
L5	Air Coil	HL5-2½ TII
L6	Air Coil	HR3.6-6½ T1
L7	Air Coil	HL3.6-3½ T1
L8	Air Coil	HL3.6-3½ T1
L9	Air Coil	HL4-4½ T1
L10	Air Coil	VL4-14½ T1
L11	Air Coil	HL5-2½ TII
L12	Choke Coil	LA04 NA 1ROM
L13	Not used	
L14	Choke Coil	LA04 NA 150K
L15	Antenna Coil	AC-149
L16	Antenna Coil	AC-149
L17	Antenna Coil	AC-149
L18	Antenna Coil	AC-150
L19	Antenna Coil	AC-151
L20	OSC Coil	OC-016
L21	OSC Coil	OC-117
L22	OSC Coil	OC-118
L23	OSC Coil	OC-119
L24	AM IF Coil	OA-043

LAMPS

PL1-	Panel Lamp 8 V 30 mA	P-240078
2		

TRANSISTORS

Q1-	2SC1674(L)	
4		
Q5	2SC1674(K)	
Q6	2SC930(D)	
Q7	2SC930(E)	
Q8	2SC930(D)	
Q9	2SC1959(Y) or 2SC2120(Y)	

RESISTORS PZ: Axial Type UZ: Radial Type

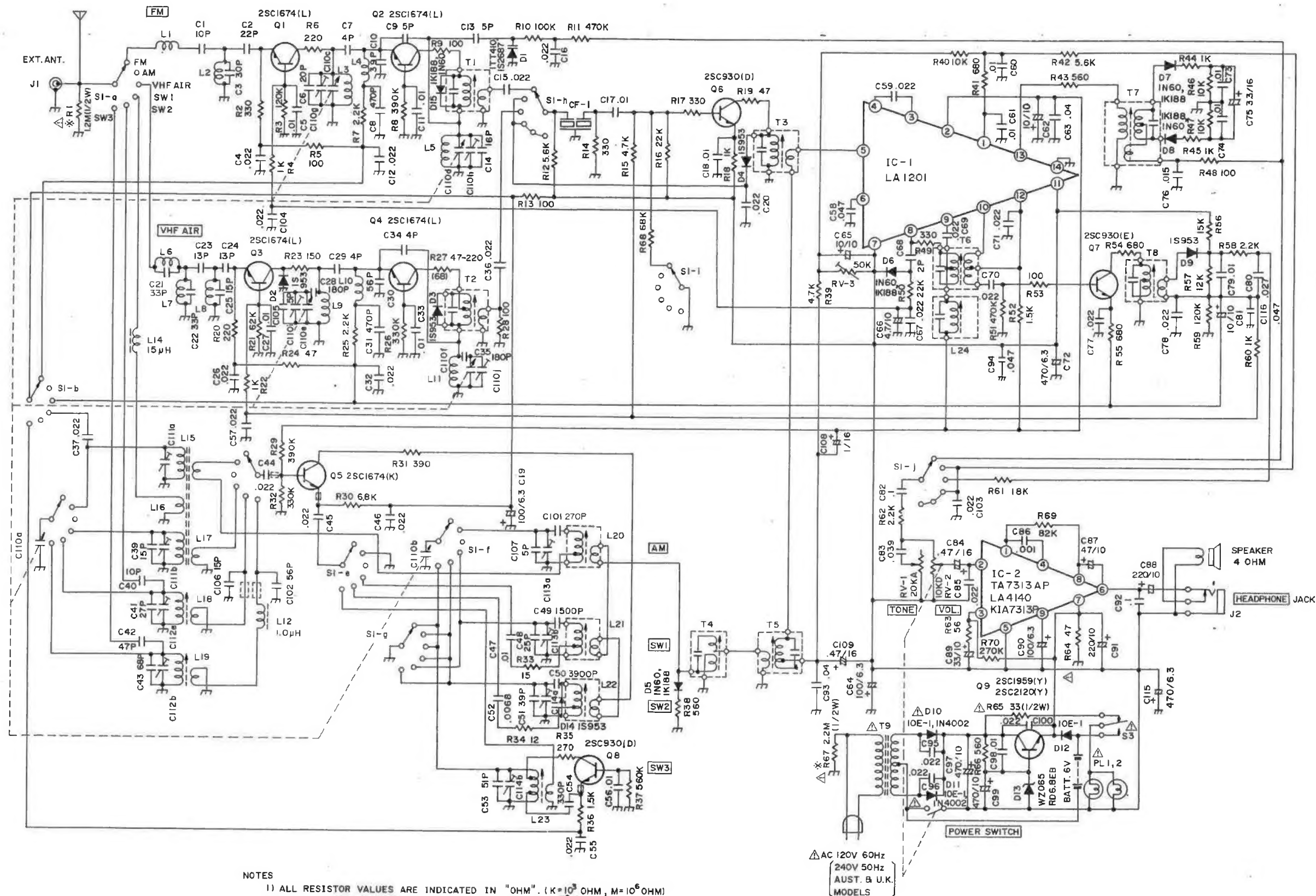
R1	1.2 MΩ ½ W PZ Carbon (for USA/Canada)	
R2	330 Ω ¼ W PZ Carbon	
R3	120 KΩ ¼ W PZ Carbon	
R4	1 KΩ ¼ W PZ Carbon	
R5	100 Ω ¼ W PZ Carbon	
R6	220 Ω ¼ W PZ Carbon	
R7	2.2 KΩ ¼ W PZ Carbon	
R8	390 KΩ ¼ W PZ Carbon	
R9	100 Ω ¼ W PZ Carbon	
R10	100 KΩ ¼ W PZ Carbon	

Ref. No.	Description	RS Part No. (Mfr's Part No.)	Ref. No.	Description	RS Part No. (Mfr's Part No.)
R11	470 K Ω 1/4 W PZ Carbon		R64	47 Ω 1/4 W PZ Carbon	
R12	5.6 K Ω 1/4 W PZ Carbon		R65	33 Ω 1/4 W PZ Carbon	
R13	100 Ω 1/4 W PZ Carbon		R66	560 Ω 1/4 W PZ Carbon	
R14	330 Ω 1/4 W PZ Carbon		R67	2.2 M Ω 1/4 W PZ Carbon (for USA/Canada)	
R15	4.7 K Ω 1/4 W PZ Carbon		R68	68 K Ω 1/4 W PZ Carbon	
R16	22 K Ω 1/4 W PZ Carbon		R69	82 K Ω 1/4 W PZ Carbon	
R17	330 Ω 1/4 W PZ Carbon		R70	270 K Ω 1/4 W PZ Carbon	
R18	1 K Ω 1/4 W PZ Carbon		SWITCHES		
R19	47 Ω 1/4 W PZ Carbon		S1a	Band Selector Switch	P-180253
R20	220 Ω 1/4 W PZ Carbon		-j		
R21	62 K Ω 1/4 W PZ Carbon		S2	Not used	
R22	1 K Ω 1/4 W PZ Carbon		S3	Dial LIGHT Switch	P-180193
R23	150 Ω 1/4 W PZ Carbon		TRANSFORMERS		
R24	47 Ω 1/4 W PZ Carbon		T1-3	FM IFT 0F-011	P-140011
R25	2.2 K Ω 1/4 W PZ Carbon		T4	AM IFT 7A-041A	P-130041A
R26	330 K Ω 1/4 W PZ Carbon		T5	AM IFT 7A-042A	P-130042A
R27	68 Ω 1/4 W PZ Carbon		T6	FM IFT 0F-073	P-140073
R28	100 Ω 1/4 W PZ Carbon		T7	FM IFT 7F-045	P-140045
R29	390 K Ω 1/4 W UZ Carbon		T8	FM IFT 0F-034	P-140034
R30	6.8 K Ω 1/4 W PZ Carbon		T9	Power Transformer 120 V 60 Hz (For USA)	P-100385 or P-100639
R31	390 Ω 1/4 W PZ Carbon		T9	Power Transformer 120 V 60 Hz (For Canada)	P-100385
R32	330 K Ω 1/4 W PZ Carbon		T9	Power Transformer 240 V 50 Hz (For Australia)	P-100688
R33	15 Ω 1/4 W UZ Carbon		T9	Power Transformer 240 V 50 Hz (For UK)	P-100825
R34	12 Ω 1/4 W UZ Carbon		VARIABLE RESISTORS		
R35	270 Ω 1/4 W PZ Carbon		VR1	TONE 20 KA	P-171417 or P-171542
R36	1.5 K Ω 1/4 W PZ Carbon		VR2	VOLUME 10 KD	P-171415 or P-171487
R37	560 K Ω 1/4 W PZ Carbon		VR3	Semi Fixed Resistor V8K 50 K Ω	P-170536
R38	560 Ω 1/4 W PZ Carbon				
R39	4.7 K Ω 1/4 W PZ Carbon				
R40	10 K Ω 1/4 W PZ Carbon				
R41	680 Ω 1/4 W PZ Carbon				
R42	5.6 K Ω 1/4 W PZ Carbon				
R43	560 Ω 1/4 W PZ Carbon				
R44	1 K Ω 1/4 W PZ Carbon				
R45	1 K Ω 1/4 W PZ Carbon				
R46	10 K Ω 1/4 W PZ Carbon				
R47	10 K Ω 1/4 W PZ Carbon				
R48	100 Ω 1/4 W PZ Carbon				
R49	330 Ω 1/4 W UZ Carbon				
R50	22 K Ω 1/4 W PZ Carbon				
R51	470 K Ω 1/4 W PZ Carbon				
R52	1.5 K Ω 1/4 W UZ Carbon				
R53	100 Ω 1/4 W PZ Carbon				
R54	680 Ω 1/4 W PZ Carbon				
R55	680 Ω 1/4 W PZ Carbon				
R56	15 K Ω 1/4 W PZ Carbon				
R57	12 K Ω 1/4 W PZ Carbon				
R58	2.2 K Ω 1/4 W PZ Carbon				
R59	120 K Ω 1/4 W PZ Carbon				
R60	1 K Ω 1/4 W PZ Carbon				
R61	18 K Ω 1/4 W PZ Carbon				
R62	2.2 K Ω 1/4 W PZ Carbon				
R63	56 Ω 1/4 W PZ Carbon				

EXPLODED VIEW PARTS LIST

Ref. No.	Description	RS Part No.	Mfr's Part No.	Ref. No.	Description	RS Part No.	Mfr's Part No.
1A	Rear Cabinet Ass'y			27	Pointer		P-610406A
-D	1A Rear Cabinet		P-600098	28A	Handle Ass'y		
	1B Rating Plate (for USA)		P-730421	-C	A Handle	HC 1092	P-610402
	Rating Plate (for CA)		P-730422		B Handle Bracket	HC 1091	P-610516A
	Rating Plate (for UK)		P-730423		C Handle Plate		P-710141A
	Rating Plate (for AU)		P-730424	29	Speaker		P-270111 or
	1C Battery Contact		P-410617				P-270112
	1D Battery Spring		P-440068	30	Speaker Bracket		P-410278
2A	Battery Cover Ass'y			31A	Front Cabinet Ass'y		
-B	2A Battery Cover		P-600095-2	-F	A Front Cabinet		P-600229
	2B Cushion		P-820322		B Dial Window		P-640123
3	VHF Rod Antenna (For USA, UK, AU)		P-330015A		C Speaker Net		P-660243
	VHF Rod Antenna (For CA)		P-330029		D Panel C		P-710134
4	Lug Terminal		P-320075		E Panel B		P-710133
5	PCB Radio Unit		U-24607		F Panel A		P-710236
6	Antenna Coil (L15, 16, 17)		P-110149	32	Dial LIGHT Spring		P-440091
7	AC Cord (For USA, CA)		P-310094	33	Dial LIGHT Knob		P-650186B
	AC Cord (For UK)		P-310091	34	Band Selector Knob		P-650187C
	AC Cord (For AU)		P-310034	35	Coil Spring (For Tuning Knob)		P-440090
8	Strain Relief Grommet (For USA, CA, UK)		P-480010	36	TUNING Knob		P-650337
	Strain Relief Grommet (For AU)		P-480080	37	FINE TUNING Knob		P-650362
9	Power Transformer (For USA)		P-100385 or	38	Bushing		P-610407
	Power Transformer (For CA)		P-100639	39	TONE & VOLUME Knob		P-650233A
	Power Transformer (For UK)		P-100385	F1	Tapping Screw 3φ x 55PT-PLAX		
	Power Transformer (For AU)		P-100825	F2	Tapping Screw 3φ x 18PT-PLAX		
10	Clamp Connector (For USA, CA, UK)		P-100688	F3	Tapping Screw 3φ x 12PT-PLAX		
10	Terminal Block (For AU)		P-320006	F4	Tapping Screw 3φ x 10PT-PLAX		
11	Terminal Holder (For AU)		P-320223	F5	Triple Screw 3φ x 6TR		
12	Transformer Holder (For USA, CA, UK)		P-480275	F6	Egg Lug 3φ (For USA, CA)		
	Transformer Holder (For AU)		P-410832	F7	Screw 2φ x 10P		
13	Headphone Jack		P-412050	F8	Nut 2φ		
14	Dial Light Switch (S3)		P-190139	F9	Screw 2φ x 14P		
15	Bracket		P-180193	F10	E-Ring 2.5E		
16	Pulley Shaft A		P-411445	F11	Screw 2φ x 5P		
17	Pulley C		P-420197	F12	Screw 2.6φ x 6P		
18	Double Pulley Shaft		P-430007	F13	Nut 3N		
19	Double Pulley		P-430032	F14	Triple Screw 3φ x 10TR		
20	String Shaft		P-430010	F15	Tapping Screw 3φ x 8PT-PLAX		
21	Pulley 76		P-420244	F16	Square Nut (For AU)		P-410111
22	Tuning Shaft		P-430031	F17	Triple Screw 3φ x 16TR (For AU)		
23	Pulley		P-420229				
24	Spring B		P-430025				
25	Band Indicator		P-440074				
26A	Dial Base Ass'y		P-710054C				
-D	A Dial Base		P-610401				
	B Dial Scale		P-640286				
	C Mirror Plate		P-710082				
	D Lamp PCB Ass'y						
	E Cushion		P-680222				

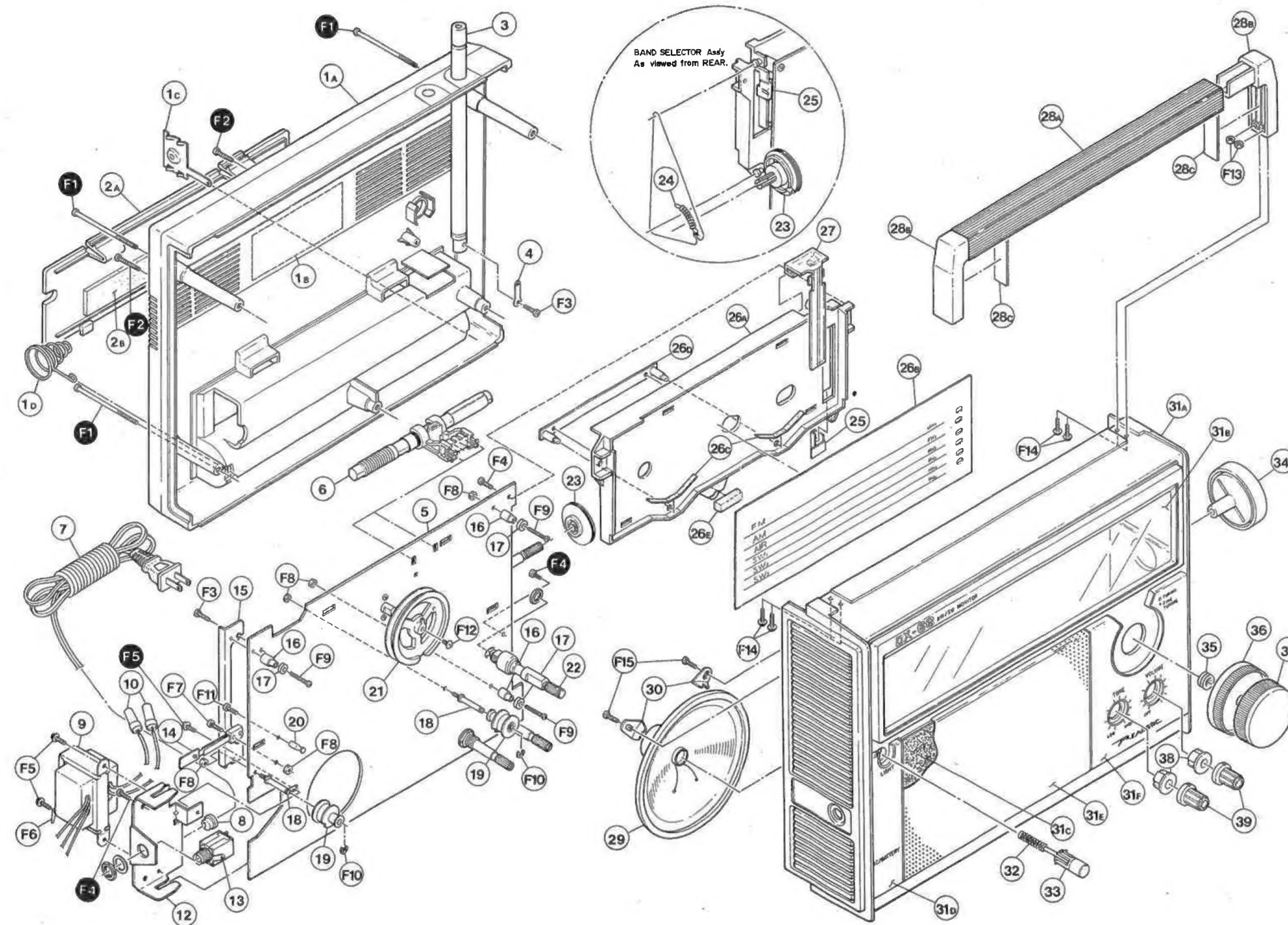
SCHEMATIC DIAGRAM



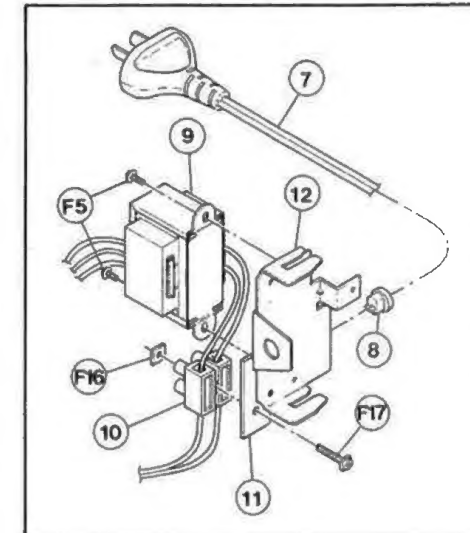
NOTES

- 1) ALL RESISTOR VALUES ARE INDICATED IN "OHM". (K=10³ OHM, M=10⁶ OHM)
- 2) ALL CAPACITOR VALUES ARE INDICATED IN "uF". (P=10⁻⁶ uF)
- 3) * FOR AUST. & U.K. MODELS, R1 AND R79 ARE NOT USED.
- 4) MARKED Δ PARTS ARE CRITICAL FOR SAFETY. REPLACE ONLY WITH PART NUMBER SPECIFIED.

EXPLODED VIEW



For UK/Australian Models Only



DISASSEMBLY INSTRUCTIONS

Removal of Cabinet & Chassis

- (1) Turn Power Switch OFF and remove Line Cord from AC Wall Outlet.
- (2) Remove Knobs (TUNING & FINE TUNING, BAND SELECTOR, VOLUME, Bushings (38)).
- (3) To remove cabinet back, remove the 5 screws (3 screws (F1) and 2 screws (F2)) from the rear.
- (4) Remove the antenna and Battery leads.
- (5) Loosen the screw (F5), and move to the left (away from the Power Transformer).
- (6) Remove 2 screws (F4).
- (7) Carefully remove the chassis from the front of the cabinet.